WHAT IS CLAIMED IS:

1. A method of optimizing the topology of the IEEE 1394 serial bus having a plurality of nodes each with communication ports, comprising the steps of:

   prioritizing said nodes according to the number of said ports and the
5 transmission speed;

   connecting a non-used port of the node of the first priority with a port of the node of the second priority; and

   repeating the previous step until all of said nodes are connected together, whereby said nodes are connected through said ports according to priority order.

   2. A method as defined in Claim 1, wherein the step of prioritizing is performed so as to firstly assign higher priority to the node of greater transmission
10 speed, and then to secondly assign higher priority to the node having greater number of said ports.

3. A method of optimizing the topology of the IEEE 1394 serial bus
15 having a plurality of nodes each with communication ports, comprising the steps of:

   comparing the total port number of all of said nodes with a reference value varying with the number (N) of said nodes to determine whether the prerequisite for constructing said topology is satisfied;

   prioritizing said nodes according to the number of said ports and the
20 transmission speed when said prerequisite is satisfied;

connecting a non-used port of the node of the first priority with a port of the node of the second priority;

repeating the previous step until all of said nodes are connected together; and

separating the last connected node to assign to the node of the foremost priority among the next speed group higher priority than the separated node when no port remains in the node of the first priority to connect with the node of the second priority during the previous step, whereby said nodes are connected through said ports according to priority order.

4.   A method as defined in Claim 3, wherein the step of comparing determines that the prerequisite for constructing said topology is satisfied if the total port number of all of said nodes is equal to or greater than 2(N-1).

5.   A method as defined in Claim 3, wherein the step of prioritizing is performed so as to firstly assign higher priority to the node of greater transmission speed, and then to secondly assign higher priority to the node having greater number of said ports.